STANFORD UNIVERSITY CALIFORNIA.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 5

S
Insect Control-Sierra
San Joaquin Project

Northfork, Cal.
April 26, 1922.

REVISED WORKING PLAN - SEASON 1922

THE SAN JOAQUIN INSECT CONTROL PROJECT.

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SAN JOAQUIN INSECT CONTROL PROJECT

Revised Working Plan - Season of 1922.

The history of this project, including the first season's work in 1920, is covered in the first annual report. A subsequent memorandum to Mr. Benedict in October, 1921, gives the tentative results of the work carried out during the season of 1921.

Briefly, the purpose of this project is to follow up the initial control work with maintenance. The original conception of this maintenance work is to carry on enough control each year to hold the infestation to a minimum. The San Joaquin project has undertaken to carry out the maintenance work as a season long operation and to combine insect control with fire protection during the summer.

RESULTS TO DATE:

One of the first experimental features of the project was the testing out of two untried methods of control. These were the trap tree method, which was to be used as a means of localizing infestation at accessible points; and the killing of broods during the fire season by solar heat. The results obtained during the seasons of 1920 and 1921 have failed to demonstrate the effectiveness of the trap tree in maintenance control. The solar heat system of destroying broods however has been proven to be an effective and practicable method of control during the summer season.

THE PROJECT TO DATE SHOWS THE FOLLOWING QUANTITATIVE RESULTS:

During the season of 1919 when no control work was carried on, the insects killed 2,349,000 board feet of pine stumpage on the project area. This amounted to a little over one tenth of one percent of the yellow pine and sugar pine stand for the entire area.

In the spring of 1920 control work was initiated by treating the overwintering infestation on the area. This was followed by summer maintenance work. The cost of both spring control and summer maintenance amounted to a little over $7,000.

During the season of 1920 barkbeetles killed 925,000 board feet of standing trees in addition to 265,000 board feet of selected trap trees. Compared with 1919 this shows a reduction in annual loss of approximately 50% or one million feet, bringing the seasonal loss down to one twentieth of one per cent of the stand.

In 1921 only a limited amount of spring work was carried out, but the summer maintenance work was continued on a more intensive scale than the previous season. The cost of the work for this season amounted to $3,500. The final cruise which will determine the total seasonal loss for 1921 will

not be completed until the summer of 1922, but records now available indicate that the loss will closely approximate that of 1920.

The plan followed during both seasons has been to spread the work throughout the accessible sections of the entire area. No effort has been made to work the entire area intensively but to get a certain percent of the infestation at as low an expense as possible.

POSSIBLE INFLUENCE OF MAINTENANCE WORK:

If it is found that the infestation did not decrease under the second season of maintenance work, the following questions will naturally occur:

1. Would the infestation have increased materially if no maintenance work at all had been done in 1921?

2. Would it have been possible to reduce this loss further by carrying out the work more intensively by treating a higher percent of the seasonal infestation?

3. To what extent did the trap trees hold the infestation by keeping it out of standing trees?

4. Would the same or a more favorable result have been accomplished if no summer maintenance work had been carried out, but the funds spent on spring work in treating a higher percent of the overwintering infestation?

One way of answering the first question would be to compare the area under maintenance control with other areas where no control has been done. A check cruise has been kept on the Stevenson Creek area south of the San Joaquin river which shows that in 1920 the infestation in that drainage was decreasing. Just north of the project area in the Miami and Mariposa districts reports coming in in the late fall of 1921 indicate that there has been a sudden and conspicuous increase in the infestation throughout a wide area. This situation will be studied during the coming season, but nevertheless it will be very difficult to determine whether the course of the infestation on the San Joaquin Area, if no control work had been done, would have been the same as that in the Stevenson Creek watershed or in the Mariposa District.

It seems reasonable to assume that maintenance work when carried out so as to treat 50% of the seasonal infestation will prevent an increase or possibly bring about a reduction. This assumption would account for the apparent low status of the infestation on the San Joaquin area. However, it is evident that it will not pay to carry maintenance work beyond a certain point as the amount of timber which can be saved by working an endemic infestation does not warrent a high cost for maintenance control. Possibly control can be maintained as well by keeping an area under surveillance and working only at intervals of several years or whenever there is an indication of increase.

In reviewing the first annual report of this project, Dr. A. D. Hopkins brought out this point: "In the plans for subsequent work, I would suggest including only about half of the area in the intensive plan proposed and leaving the other half without treatment unless there is evidence of a decided increase. I am confident that control can be maintained at far less refinement and cost than the plans involve. Anyhow, there is no check on the intensive method. How will you know that just as good results would not be had by less intensive and expensive methods? It is evident that the urgent need in connection with this project is to determine how the cost of maintenance can be reduced and how to prove it".

This is unquestionably the best line of attack to follow at present in the solution of the maintenance problem as applied to the San Joaquin area. As long as the low endemic condition of the infestation continues, the area can safely be given over to experimental work to settle the maintenance problem.

The project area is already organized in such a way that its division into two areas to meet the requirements of the proposed experiment can readily be made. The Northfork and Chiquito Districts as originally outlined for administrative purposes are of such size and so well separated that it seems hardly possible that the work carried out in one will materially affect the infestation of the other. For the purpose of such an experiment it will be best to consider them as fairly complete entomological units.

The plan now proposed involves:

1. Discontinuance of all control work in the Northfork district, with the exception of such work in the sugar pine belt as may be necessary to meet cooperation with the Sugar Pine Lumber Company. It is doubtful if this work will be undertaken as the local manager of the company is satisfied with the present condition. The large yellow pine belt of this district is almost entirely under Forest Service control and forms a very satisfactory area for comparative purposes with the Chiquito Basin.

2. Continuance of both spring and summer maintenance work in the Chiquito District. It is proposed to divide this District into smaller sub-units and vary the intensity of the work in order to secure data as to the following points:

(a) Possible variation of results which may be secured by varying the percent of infestation removed from similar areas.
(b) Comparative costs involved in removing a high or low percent of the infestation from similar areas.

OUTLINE OF PROPOSED EXPERIMENTAL WORK IN THE CHIQUITO DISTRICT:

Six topographic units, covering practically all of the yellow pine type of the upper San Joaquin basin have been outlined as shown on the ac-

companying map. Rocky Creek 7680 92,160,000

UNIT NO.	NAME	ACREAGE	VOLUME OF Y. PINE STAND
26a	Logan's	5440	43,520,000 board feet
26b	Forked Meadow,	3200	36,894,000 " "
26c	West Chiquito,	5760	69,120,000 " "
26d	Arnold Meadow,	5120	61,440,000 " "
27	Jackass,	16,640	49,920,000 " "
28	Dalton,	3200	19,200,000 " "
TOTALS:		39,360	279,454,000 board feet
30	Crane Valley	7680	61,440 cor

All of the units listed have been covered by the maintenance work of the past two seasons with the exception of a ~~large~~ part of the Jackass Unit (28) which has been thrown out because of inaccessibility and low value of stand. The 1922 work will be carried out as follows:

1. Spring Control Work Only. Units 26d (Arnold) and 28 (Dalton). Accessible overwintering trees will be treated but no work performed during the summer.

2. Combined Spring and Summer Work without Trap Trees. Unit 26c (West Chiquito). To be covered by spring work and cruised at least twice during the summer for standing trees which will be treated.

3. Combined Spring and Summer Work with Trap Trees Unit 26a (Logan's). This will be covered by spring work and followed by two successive trips during the summer using trap trees as practiced during the season of 1921.

4. Complete Extermination by Combined Spring and Summer Work. Unit 26b (Forked Meadow). This will be primarily an experiment to determine how far it is possible to reduce the infestation by intensive work on a local area and how much this intensive work will cost. The area was selected for this purpose mainly because it is an unusually favorable one to work in this way.

5. Natural Control of Infestation Where no Work is Carried On. Unit 27 (Jackass). This unit will be cruised and all trees marked for comparison with the other units that are being treated. This will afford a check in addition to that of the yellow pine belt of the Northfork District which lies outside of the Chiquito District.

In case it is found that the results of the work within the Chiquito District are not local to the subunits outlined but distributed thruout the entire basin, the experimental value of the work will by no means be lost, as the sum total of the work within the Chiquito District may still be compared with the Northfork District where no work is done.

DISTRIBUTION OF COSTS:

As the work in all of the subunits will be carried out by the same control crew, the cost will be computed according to the amount of time

spent on each subunit. The two items of cost which will vary with the intensity of the work are the following:

1. Cruising: This will be computed from the cruiser's record of time spent upon each subunit.

2. Treatment of infested trees. Records will show time of treatment and number of men working for each individual tree. The cost per man hour, which will be computed at the close of the season's work will be applied according to the time record of treatment for each unit.

GENERAL SCHEDULE OF WORK:

Spring work to cover units 26a, 26b, 26c, 26d and 28 to start April 3rd. One cruiser foreman and five men will carry out this work which will terminate about May 20.

Summer work on units 26a, 26b and 26c, to run from May 20 to October 15. This work will be carried out by one cruiser and two fallers.

REVISION OF COST ESTIMATES:

	FOREST SERVICE	BUREAU OF ENTOMOLOGY
E.A.Morrow, Foreman Chiquito Crew.		
Salary April 1 to November 1,		$700.00
Subsistence, 7 months,	$210.00	
Spring work, Chiquito District.		
Five laborers, April 1 to May 15,		
225 man days @ $3.00, wages,	675.00	
225 man days @ $1.00, subsistence,	225.00	
Summer work, Chiquito District.		
2 laborers, May 18 to October 16.		
300 man days @ $3.00, wages,	900.00	
300 man days @ $1.00, subsistence,	300.00	
Check cruise of Northfork District.		
Albert Wagner, cruiser, salary 3 months,		350.00
Albert Wagner, subsistence,	108.00	
Albert Wagner, transportation,	25.00	
TOTALS:	$2543.00	$1050.00

Submitted, April 26, 1922.

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Northfork, California.